

ABSTRACT

A process for increasing the specific output of a combined cycle power plant and providing flexibility in the power plant rating, both without a commensurate increase in the plant heat rate, is disclosed. The present invention demonstrates that the process of upgrading thermal efficiencies of combined cycles can often be accomplished through the strategic use of additional fuel and/or heat input. In particular, gas turbines that exhaust into HRSGs, can be supplementally fired to obtain much higher steam turbine outputs and greater overall plant ratings, but without a penalty on efficiency. This method by and large defines a high efficiency combined cycle power plant that is predominantly a Rankine (bottoming) cycle. Exemplary embodiments of the present invention include a load driven by a topping cycle engine, powered by a topping cycle fluid which exhausts into a heat recovery device.